Amendments to the Claims

1. (currently amended) A method for transmitting an input stream of symbols in a multiple-input / multiple-output wireless communications system including *M* subgroups of transmitting antennas, comprising:

selecting, according to channel conditions of the multiple-input / multiple-output wireless communications system, *L* subgroups of the *M* subgroups of antennas, where $L < M$ and each of the *L* subgroups of antennas includes a set of at least two antennas;

demultiplexing, the input stream into *L* substreams, there being one substream for each one of the *L* selected subgroups of at least two antennas;

adaptively modulating and coding each of the *L* substreams to a maximum data rate while achieving a predetermined performance on an associated channel used to transmit the substream;

space-time transmit diversity encoding each of the *L* coded substreams into a set of at least two output streams, there being one output stream ~~in each set~~ for each antenna in the set of at least two antennas of each one of the *L* subgroups of antennas; and

transmitting the set of at least two output streams using the *L* subgroups of at least two antennas.

2. (currently amended) The method of claim 1, further comprising:

feeding back, from a receiver, channel conditions; and

selecting a data rate ~~the *L* substreams to be produced by the demultiplexing~~ according to the channel conditions.

3. (currently amended) The method of claim 2, in which the channel conditions used to select the data rate measure a signal to interference plus noise ratio of the output streams received in the receiver.

4. (original) The method of claim 1, in which the adaptive modulation and coding depends on the number L of the substreams.

5. (original) The method of claim 1, in which L is zero to increase an overall capacity of the system including a plurality of receivers.

6. (original) The method of claim 1, in which the adaptive modulating and coding, further comprises:

coding each substream;

interleaving each coded substream; and

symbol mapping each interleaved substream.

7. (original) The method of claim 1, further comprising:

demultiplexing each output stream into a plurality demultiplexed output streams;

multiplying each of the plurality of demultiplexed output streams by an orthogonal variable spreading factor;

adding the demultiplexed output streams, for each ouput stream, after multiplication into a summed output stream corresponding to each output stream; and

multiplying each summed output stream by a scrambling code.

8. (currently amended) A system for transmitting an input stream of symbols in a multiple-input / multiple-output wireless communications system including *M* subgroups of transmitting antennas, comprising:

a switch configured to select, according to channel conditions of the multiple-input / multiple-output wireless communications system, *L* subgroups of the *M* subgroups of antennas, where $L < M$ and each of the *L* subgroups of antennas includes a set of at least two antennas;

a demultiplexer configured to split the input stream into *L* substreams, there being one substream for each one of the *L* subgroups of at least two antennas;

means for adaptively modulating and coding each of the *L* substreams to a maximum data rate while achieving a predetermine performance on an associated channel used to transmit the substream; and

means for space-time transmit diversity encoding each of the *L* coded substream into a set of at least output streams, there being one output stream ~~in each set~~ for each antenna in the set of at least two antennas of each one of the *L* subgroups of antennas.

9. (new) The method of claim 1, wherein each input substream includes pairs of symbols X_{i1} and X_{i2}, and wherein the space-time transmit diversity encoding encodes each pair of symbols as two pairs of symbols

$$\begin{bmatrix} X_{i2} & X_{i1} \\ -X_{i1}^{*} & X_{i2}^{*} \end{bmatrix},$$

where * is a complex conjugate.

10. (new) The method of claim 9, wherein each pair of symbols X_{i1} and X_{i2} is transmitted by a first antenna of the set of at least two antennas while each pair of symbols $-X^*_{i2}$ and X^*_{i1} is transmitted by a second antenna of the set of at least two antennas.

11. (new) The method of claim 1, wherein the selecting is performed before the adaptively modulating and coding and the space-time transmit diversity encoding.

12. (new) The method of claim 1, further comprising:

performing the adaptively modulating and coding and the space-time transmit diversity encoding in parallel and independently for each substream.

13. (new) The method of claim 1, wherein the number of selected antennas is at least $2L$.

14. (new) The method of claim 1, wherein performance reaches a maximal system capacities.

15. (new) The method of claim 7, wherein the orthogonal variable spreading factors are the same for all output streams.

16. (new) The method of claim 7, wherein the scrambling codes are the same for all output streams.